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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/513,362	02/25/00	CHEE M	A-67851-2/DJ

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EXAMINER	
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ART UNIT	PAPER NUMBER
1656	7

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Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

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Office Action Summary	Application No.	Applicant(s)	
	09/513,362	CHEE ET AL.	
	Examiner	Art Unit	
	Teresa E Strzelecka	1656	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-21* is/are rejected.

7)☒ Claim(s) *1,6,7,13,14 and 19* is/are objected to.

8)☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *25 February 2000* is/are objected to by the Examiner.

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☒ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. & 119(e).

Attachment(s)

15) ☒ Notice of References Cited (PTO-892)
16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
17) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
18) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
19) ☐ Notice of Informal Patent Application (PTO-152)
20) ☐ Other: .

DETAILED ACTION

Priority

1. Applicant's claim for domestic priority under 35 U.S.C. 119(e) is acknowledged. However, the provisional application No. 60/160,027 upon which priority is claimed fails to provide adequate support under 35 U.S.C. 112 for claims 1-21 of this application: the provisional application No. 60/160,027 is directed to "Clothes Dryer Wall Vent Box", which has nothing to do with the claimed subject matter.

Specification

2. The disclosure is objected to because of the following informalities: undefined abbreviations and symbols, unclear terminology.

A) Page 21, line 22: "...clonal nucleic acids..."; line 25: "...IBL/DBL pairs...".

B) Page 25 line 30: unclear sentence starting with "Chemically modified sites...".

C) Page 28, line 31: "...IBL/DBL pairs...".

D) Page 47, Eqn.1-4 and page 48, Eqn.5: no definitions of the symbols used in the equations.

E) Throughout the specification: (PPi) instead of (PP_i).

Appropriate correction is required.

Drawings

3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: reference character "50" is not shown in Fig. 1C. Correction is required.

4. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description: reference character "100" in Fig. 1C is not described in the specification. Correction is required.

Claim Objections

5. Claims 1, 6, 7, 13, 14, 19 are objected to because of the following informalities: use of (PPi) instead of (PP_i) to denote pyrophosphate. Appropriate correction is required.

Double Patenting

6. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

7. Claims 10-11 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-2 of copending Application No. 09/425,633. Although the conflicting claims are not identical, they are not patentably distinct from each other because the only difference between claim 10 and claim 1 of the Application No. 09/425,633 is broader scope.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 112

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claims 6 and 12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

A) Claim 6 recites the limitation "said enzyme" in page 51, line 30. There is insufficient antecedent basis for this limitation in the claim.

B) Claim 12 recites the limitation "said sequencing primer" in page 52, line 15. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

11. Claims 1-3, 6-9 are rejected under 35 U.S.C. 102(b) as being anticipated by Nyren et al. (WO 98/13523).

Nyren et al. teach a real-time DNA sequencing method, in which the target DNA is hybridized with a primer, the complex is subjected to a polymerization reaction in the presence of dioxynucleotides (dNTPs) or dideoxynucleotides (ddNTPs). Incorporation of

the dNTPs or ddNTPs results in the release of pyrophosphate (PP_i) when the inserted base is complementary to the target base. The released PP_i molecules are detected using a sequence of enzymatic reactions employing sulfurylase and luciferase. (Abstract, pp. 3-6). Either the target DNA or the primer can be immobilized on a solid support, resulting in an immobilized hybridization complex. The solid support can include microspheres (pp. 7-9). Nyren et al. also teaches kits for sequencing of multiple DNA sequences comprising primers, polymerase, detection enzymes for pyrophosphate release and DNA on solid support.

12. Claims 10, 12 are rejected under 35 U.S.C. 102(e) as being anticipated by Sosnowski et al. (U.S. Patent No. 6,051,380).

Sosnowski et al. teach an array for performing nucleic acid hybridization and other molecular biology procedures, including amplification of target DNA by polymerases (col. 7, lines 2-19; col. 12, lines 53-63) and labeling of proteins and nucleic acids (col. 29, lines 54-58). The array consists of microlocations on a solid support, each of the microlocations containing specific binding entities, e.g. functionalized microstructures or nanostructures (col. 9, lines 10-32). Hybridization reactions can involve use of capture probes (col. 11, lines 3-12; col. 31, lines 24-28). Use of nanoparticles with DNA probes in the hybridization assay is shown in Example 8. DNA synthesis by a polymerase using a capture probe as a primer for the polymerase is shown in Example 10 (col. 60, lines 13-58).

Claim Rejections - 35 USC § 103

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

14. Claims 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nyren et al. as applied to claim 1 above, and further in view of Balch (U.S. Patent No. 6,083,763).

A) Claim 4 is drawn to the hybridization complex comprising target sequence, sequencing primer and a capture probe covalently attached to a surface, claim 5 is drawn to the hybridization complex comprising target sequence, sequencing primer, an adapter probe and a capture probe covalently attached to a surface.

B) Nyren et al. do not teach hybridization complexes comprising target sequence, sequencing primer, an adapter probe and a capture probe covalently attached to a surface.

C) Balch teaches molecular analysis aparatus for high-throughput analysis of molecular targets in complex mixtures. This apparatus can be used for DNA amplification and sequencing in an array format. (Abstract, Example III). Each location of the array comprises a capture probe attached to a solid substrate (col. 17, lines 28-41; col. 18, lines 55-66). The target probes (adapter probes) are designed to be complementary to both the capture probes and the target nucleic acids (col. 20, lines 39-49; Fig. 5a). The capture probes can be used directly to form hybridization complexes with the target nucleic acid sequences (col. 21, lines 21-23).

It would have been obvious to one of ordinary skill in the art at the time of the invention to have used the capture probes and adapter probes of Balch for the formation of hybridization complexes of Nyren et al. with a reasonable expectation of success. The motivation to do so would have been that capture probes and adapter probes allowed greater flexibility in performing the hybridization reactions and screening of a large number of targets at the same time.

15. Claims 13-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sosnowski et al. as applied to claim 10 above, and further in view of Nyren et al. (WO 98/13523).

A) Claims 13-16 are drawn to the identification of target bases using pyrophosphate sequencing method.

B) Sosnowski et al. do not teach identification of target bases using pyrophosphate sequencing method.

C) Nyren et al. teach pyrosequencing as described above.

It would have been obvious to one of ordinary skill in the art at the time of the invention to have used the pyrosequencing method of Nyren et al. with the array of Sosnowski et al. with a reasonable expectation of success. The motivation to do so would have been that multiple pyrosequencing detecting reactions were carried out at the same time on a solid support array.

16. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sosnowski et al. as applied to claim 10 above, and further in view of Balch (see above).

A) Claim 11 is drawn to the hybridization complex comprising target sequence, a capture probe and an adapter probe.

B) Sosnowski et al. do not teach hybridization complexes comprising target sequence, a capture probe and an adapter probe.

C) Balch teaches hybridization complexes comprising capture and adapter probes on solid support (see above).

It would have been obvious to one of ordinary skill in the art at the time of the invention to have used the capture probes and adapter probes of Balch for the formation of hybridization complexes of Sosnowski et al. with a reasonable expectation of success. The motivation to do so would have been that capture probes and adapter probes allowed greater flexibility in performing the hybridization reactions and screening of a large number of targets at the same time.

17. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sosnowski et al. as applied to claim 10 above, and further in view of Metzker et al. (Nucleic Acids Research, Vol. 22, pp. 4259-4267, 1994).

A) Claim 17 is drawn to target nucleic acid sequencing in which a hybridization complex is formed between a target sequence and a probe attached to a microsphere, providing a sequencing primer, extending the primer by adding a first protected nucleotide, identifying the first protected nucleotide, removing the protection group, adding a second protected nucleotide and identifying the second protected nucleotide.

B) Sosnowski et al. do not teach sequencing using protected nucleotides.

C) Metzker et al. describe the Base Addition Sequencing Scheme (BASS) in which a primer is attached to a solid support, dNTPs with spectroscopically unique blocking groups are used in the polymerization reaction, resulting in termination of the extension reaction after one base incorporation. Each type of dNTP has a different label. The reporter group is imaged and then removed, allowing the addition of the next nucleotide (Fig. 1, page 4259).

It would have been obvious to one of ordinary skill in the art at the time of the invention to have used the base identification method of Metzker et al. in the array method of Sosnowski et al. with a reasonable expectation of success. The motivation to do so would have been that the method of Metzker et al. was performed on a solid support and used nucleotide analogs which were spectroscopically deprotected and stable during the polymerization process.

18. Claims 18-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nyren et al., Metzker et al. and Sosnowski et al. (see above).

A) Nyren et al. teach kits for pyrosequencing detection. They do not teach microspheres on a solid support.

B) Metzker et al. do not teach kits or microspheres on solid support.

C) Sosnowski et al. teach misrospheres on solid support.

It would have been obvious to one of ordinary skill in the art at the time of the invention to have added solid support for microspheres of Sosnowski et al. and labeled dNTPs of Metzker et al. to kits of Nyren et al. with a reasonable expectation of success. The motivation to do so would have been that kits were conventional in the field of molecular biology and provided the benefits of convenience and cost-effectiveness for practitioners in the art.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Teresa E Strzelecka whose telephone number is (703) 306-5877. The examiner can normally be reached on M-F (8:30-5:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, W. Gary Jones can be reached at (703) 308-1152. The fax phone numbers for the

organization where this application or proceeding is assigned are (703) 308-4242 for regular communications and (703) 305-3014 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0196.

ts
December 26, 2000
TS

KENNETH R. HORLICK
PRIMARY EXAMINER
GROUP ~~1800~~ 1600 12/26/00
Kenneth R. Horlick, Ph.D.